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EXAMINER	
PONNALURI, PADMASHRI	

ART UNIT	PAPER NUMBER
1639	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/763,607	STAHLER ET AL.	
	Examiner	Art Unit	
	Padmashri Ponnaluri	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *24-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/30/03, 2/28/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-27 are currently pending in this application.

2. Applicant's election with traverse of group I, claims 1-23 and 27, in the reply filed on 6/2/03 is acknowledged. The traversal is on the ground(s) that group I method recites that 'the carrier exposure is optionally "controlled by means of a light sensor matrix, in particular a CCD matrix" whereas claim 24 of group II recites "use of controllable illumination matrix ... in a light-emission detector for detecting the optical behavior of the a 2- or 3-dimensional test area" carrying functional materials.' Therefore the two claim group share the special technical feature of controlling light exposure ..... and a controllable illumination matrix.... And the method of claim 1 shares the special technical feature of claim 24 and should be examined together with the claims of group I'.

This is not found persuasive because a) 'examiner has noted that there is no special technical feature linking the group I and group II (i.e., see the office action mailed on 3/5/03, page 3); b) And further the instant claim 1 method recites "the carrier exposure is **optionally** controlled by means of a light sensor matrix." Thus the 'controllable illumination matrix' is not necessary to practice the group I inventions, and 'controllable illumination matrix' is not the special technical feature of group I method; c) and further it is noted the claimed 'method of preparing a carrier (biochip) coated with biologically or chemically functional materials' is already known in the prior art, i.e., see US patent 5,318,679 or US Patent 5,424,186 (cited as 'X' references in the PCT/EP99/06316) (the reference provided by applicants), accordingly, unity of invention is lacking.

The requirement is still deemed proper and is therefore made FINAL.

3. Applicants have further elected 'nucleic acids' as chemical or biological mterials; and 'illumination matrix arrangement involving transmitted light' as species to be examined in the response filed on 6/2/03. Applicants in the response filed on 10/28/04 further have elected 'ultraviolet light' as species of electromagnetic radiation used in the exposure; radiation which can be focused in different planes as the species of radiation; 'a reflection matrix' as the species of illumination matrix; and a 'glass' as the species of carrier.

4. Claims 24-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 6/2/03.

5. Claims 1-23, 27 are currently being examined in this application.

Priority

6. This application is a national stage application of PCT/EP99/06316, filed on 8/27/99.

7. Acknowledgment is made of applicant's claim for foreign priority based on several applications filed in Germany on 8/28/98; 8/19/99 and 5/27/99. It is noted, however, that applicant has not filed English translation of the German priority applications as required by 35 U.S.C. 119(b).

Information Disclosure Statement

8. The information disclosure statement (PTO 1449) filed on 6/30/03 and 2/28/01 have been considered and entered into the application.

Specification

10. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

11. The disclosure is objected to because of the following informalities: a) the specification does not have a brief description of drawings; and) the specification in page 19, lines 6-7 refers to claims 41-43.

Appropriate correction is required.

Claim Objections

12. Claims 4-11, 13-22 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim i.e., claim 4 is dependent on claim 3, which is dependent on claims 1 and 2. See MPEP § 608.01(n). Accordingly, the claims 4-23 not been further treated on the merits.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

14. Claims 1-23 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites 'can be'; 'where appropriate'; 'in particular'; and 'or/and' which make the claim indefinite. For example, it is not clear what does applicants mean by 'where appropriate'. The metes and bounds of these terms are not clear.

Claim 7 is vague and indefinite by reciting ' namely'.

Claim 9 is vague and indefinite by reciting 'for example'. Applicants are requested to amend the claim.

Claim 12 is indefinite by reciting 'inherent for', it is not clear what does applicants mean by the term. Does applicants mean that the pattern present on the illumination matrix determines the predetermined activatable areas. Applicants are requested to clarify.

Claim 14 recites an improper Markush group. Applicants are requested to amend the claim.

Claim 27 is vague indefinite by reciting 'can be'; optionally adjustable exposure pattern.'

Applicants are requested to rewrite the claims to clearly recite the claimed subject matter. Most of the claims are improperly multiple dependent on multiple dependent claims, and further the phrases 'characterized in that'; 'namely'; 'for example' and 'in particular' makes the claims vague and indefinite.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 1-23 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,271,957 B1 (Quate et al) (filing date 5/26/99, effective filing date 5/29/98).

The instant claim briefly recites a method for preparing a carrier (biochip) coated with biologically or chemically functional materials, comprising a) providing a carrier having a surface which has photoactivatable groups; b) activating the photoactivatable groups on at least on a predetermined area of the carrier surface by location specific exposure of the carrier using

an illumination matrix; c) location specific binding of biologically or chemically functional materials or building blocks; d) repeating the activation and binding steps on the same or different predetermined areas.

Note that in the instant claims 'where appropriate' is not considered as required feature; 'or/and' is considered as 'or'; 'namely' is considered as 'for example'.

Quate et al teaches methods involving direct write optical lithography. The reference teaches that polymer array (refers to the biological or chemical materials of the instant claims) synthesis is performed using a system without using a photo mask (i.e., see abstract). The reference teaches that the optical lithography system uses a spatial light modulator to generate unique predetermined image patterns at each photolithographic step in polymer array synthesis, and the spatial light modulators can be micro machined mechanical modulators (refers to the instant claim micro mechanical mirror array) (i.e., see column 3, lines 28). The reference teaches that the polymers synthesized by the method (refers to the instant claim 14) (see i.e., column 3, lines 33-35). The reference claims are drawn to a method for deprotecting reaction sites on a substrate comprising; providing a substrate having protected reaction site; modulating light direction with spatial modulator so as to generate a predetermined light pattern used for deprotection selected portions of said protected reaction sites (refers to instant claim steps a and b).

The reference teaches that certain preferred embodiments of the invention involves the use of micro machined mechanical modulators (micro mirror array) (refers to the instant claims 5-6) to direct light to predetermined regions of the substrate (refers to 'predetermien area of the carrier) (i.e., see column 3).

The reference teaches one type of mechanical modulator is a micro-mirror array which uses a small metal mirrors to selectively reflect a light beam to a particular individual features. And the reference teaches programmable micro-mirror array Digital Micro-mirror device (DMD) (i.e., see column 3). The reference teaches that DMD array consists of 640 x 480 mirrors or 800 X 600 mirrors, and each mirror is 16 μm x 16 μm which would read on the activated area of the instant claims (i.e., see column 4). The reference teaches that polymer array is synthesized with a programmable micro-mirror array using DMT process, in which a computer file is generated and specifies, for each photolithography step, which mirrors in the micro-mirror array need to be on and which need to be off to generate a particular predetermined image pattern (i.e., see column 5). The reference teaches that eh exposure of the wafer (chip) to acid then cleaves the DMT protecting groups from ragions of the wafer where the photoresist has been removed. The remaining photoresist is then stripped, and the DMT (acid labile protecting groups) protected nucleotides containing the desired base are coupled to the deprotected oligonucleotides (refers to the instant claim steps c-d) (i.e., see column 5). The reference teaches that the direct write optical system is also applicable to performing a process of deprotection of reaction sites using the DPD and PAG methods without the photoresist (refers to the photoactivatable groups of the instant claims) (i.e., see column 6). The reference further teaches that the polymer array synthesis processing can be performed using photo acid generators without using photoresist, e.g., using PAG process or DPD process (i.e., see column 6).

The reference teaches that one skilled in the art will choose the spatial modulator that is compatible with the chosen wavelength of illumination and synthesis chemistries employed. And the reference further teaches that DMD could be used in the invention with UV light. The

reference teaches that a lens 12 images the micro mirror array (DMD or GLV) onto an array having an array of microlenses or non-imaging light concentrators. Each element of the array focuses light onto the chip or wafer, each micro-lens produces an image of pixel of the micro array (i.e., see column 7).

The reference teaches that some spatial light modulators are designed to modulate transmitted rather than reflected light, and an example of transmissive spatial light modulator is a liquid crystal display (LCD) (refers to the instant claim 'light source of illumination matrix') (i.e., see column 8). Thus, the reference clearly anticipates the claimed invention.

17. Claims 1-23 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,375,903 B1 (Cerrina et al) (effective filing date 2/23/98).

The instant claim briefly recites a method for preparing a carrier (biochip) coated with biologically or chemically functional materials, comprising a) providing a carrier having a surface which has photoactivatable groups; b) activating the photoactivatable groups on at least on a predetermined area of the carrier surface by location specific exposure of the carrier using an illumination matrix; c) location specific binding of biologically or chemically functional materials or building blocks; d) repeating the activation and binding steps on the same or different predetermined areas.

Note that in the instant claims 'where appropriate' is not considered as required feature; 'or/and' is considered as 'or'; 'namely' is considered as 'for example'.

Cerrina et al teach synthesis of arrays of DNA probe sequences, polypeptides, and the like is carried out rapidly and efficiently using patterning process, and the process is automated or computer controlled (i.e., see column 2). The reference teaches that the according the present

synthesis, a substrate with an active surface to which DNA synthesis linkers have been applied to use support the probes that are to be fabricated. To activate the active surface of the substrate to provide the first level of bases, a high precision two dimensional light image is projected onto the substrate (refers to the predetermined area of the instant claims), illuminating those pixels in the array on the substrate active surface which are to be activated to bind a first base. The light incident on the pixels in the array to which light is applied deprotects OH groups and makes them available for binding of bases. After this development step, a fluid containing the appropriate base is provided to the active surface of the substrate and selected base binds to the exposed sites. The process is the repeated to bind another base to a different set of pixel locations, until all the elements of the two-dimensional array on the substrate have an appropriate base bound thereto (refers to the instant claim method) (i.e., see column 2).

The reference teaches that the image is projected onto the substrate utilizing an image former having an appropriate light source that provides light to a micro-mirror device comprising two dimensional array of electronically addressable mirrors, each of which can be tilted between one of at least two separate positions (refers to the 'illumination matrix'; 'reflection matrix'; and 'micro mechanical mirror arrays' of the instant claims) (i.e., see column 3). The reference teaches that the micro mirrors are capable of reflecting light at any wavelength without damage to them, allowing short wavelength lighting, including the light in the range of ultraviolet light (refers to the 'electromagnetic radiation which is in UV range' of the instant claims) (i.e., see column 3). The reference teaches that the micro-mirror is under control of a computer which provides appropriate pixel address signals to the micro-mirror array to cause appropriate micro-mirrors in their 'reflect' or 'deflect' positions (refers to the light sensor matrix of the instant

claims) (i.e., see column 3). The reference teaches that the substrate may be transparent (i.e., see column 3).

The reference teaches the apparatus that is used for DNA probe array synthesis, polypeptide synthesis is shown in figure 1., which includes a two-dimensional array image former, a substrate; and the image former includes a light source (e.g., an ultraviolet or near ultraviolet source (i.e., see column 4, figure 1); a micro-mirror array device; a computer controller.

The reference teaches that digital micro-mirror device (DMD) which are typically used for video projection are available in various sizes, 640 X 800 micro mirror elements, which are capable of reflecting the light of normal usable wavelengths, including ultraviolet and near ultraviolet light (i.e., see column 5). The reference teaches a glass substrate (refers to the instant claim 9) (i.e., see column 6). The reference in figures 9-14 depicts the process of forming DNA probes. The reference teaches that the substrate having a silane layer is coated with a photolabile linker molecule to form an active surface (refers to the substrate with photoactivatable groups of the instant claims). Figure 10 illustrates the photo-deprotection of the MENPOC-HEG linker and the production of free OH groups. The reference clearly anticipates the claimed invention.

Double Patenting

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 1-23, 27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-36 of copending Application No. 09/763,914. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference method for producing a support for determining analytes is very generic and does not recite how 'site and/or time-specifically immobilizing the receptor building blocks in each case on predetermined positions in the channel or channels by illumination...' (step c). However the instant claimed method for preparing a carrier coated with biologically or chemically functional materials (refers to the 'receptors or building blocks' of the reference) recites the same exact method steps, except that the instant claims recite how the building blocks or the receptor are bound to the substrate at predetermined positions. The reference support reads on the instant claim support; and the reference nucleic acids or nucleic acid analogs (claim 5), polypeptides (claim 6), amino acids (claim 8) reads on the instant claim biological functional materials (claim 14); and 'illumination matrix' (claim 8)

reads on the 'illumination matrix' of the instant claims; the support is optically transparent (claim 24) refers to the instant claim 9; the apparatus further comprises electronic control means refers to the controller. Thus the claimed method is obvious variant of the reference method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

20. Claims 1-23, 27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-38 of copending Application No. 10/727,566. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference method for producing a support for determining analytes is very generic and does not recite how 'site and/or time-specifically immobilizing the receptor building blocks in each case on predetermined positions in the channel or channels by illumination...' (step c). However the instant claimed method for preparing a carrier coated with biologically or chemically functional materials (refers to the 'receptors or building blocks' of the reference) recites the same exact method steps, except that the instant claims recite how the building blocks or the receptor are bound to the substrate at predetermined positions. The reference support reads on the instant claim support; and the reference nucleic acids or nucleic acid analogs (claim 5), polypeptides (claim 6), amino acids (claim 8) reads on the instant claim biological functional materials (claim 14); and 'illumination matrix' (claim 8) reads on the 'illumination matrix' of the instant claims; the support is optically transparent (claim 24) refers to the instant claim 9; the apparatus further comprises electronic control means refers to the controller. Thus the claimed method is obvious variant of the reference method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

21. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Padmashri Ponnaluri whose telephone number is 571-272-0809. The examiner is on Increased Flex Schedule and can normally be reached on Monday through Friday between 7 AM and 3.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Padmashri Ponnaluri
Primary Examiner
Art Unit 1639

18 January 2005

PADMASHRI PONNALURI
PRIMARY EXAMINER